Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supplementary Information for

Room Temperature NH_3 Detection of Ti / Graphene devices Promoted by Visible Light Illumination

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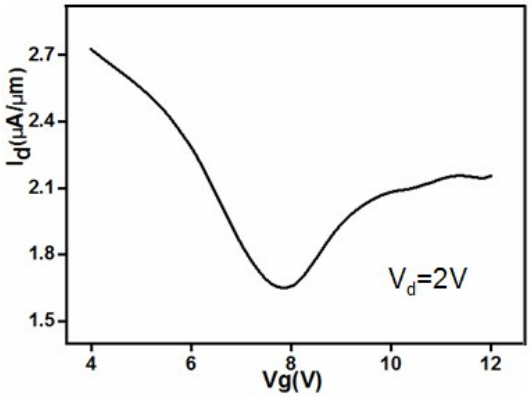


Figure S1. Transfer characteristic curve of a top gate field effect transistor of pristine graphene.

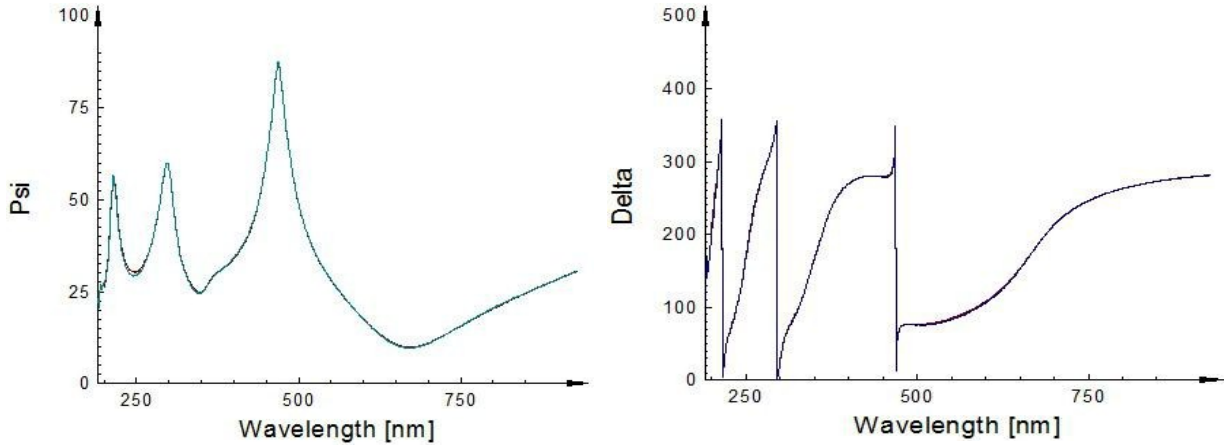


Figure S2. Experimental and fitted ellipsometry curves of the 3 nm Ti/Gr device.

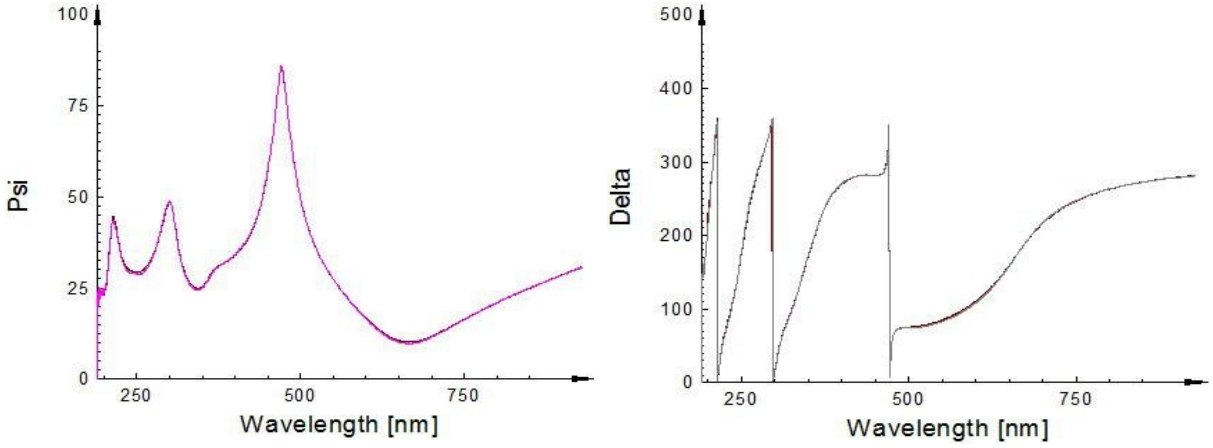


Figure S3. Experimental and fitted ellipsometry curves of the 5 nm Ti/Gr device.

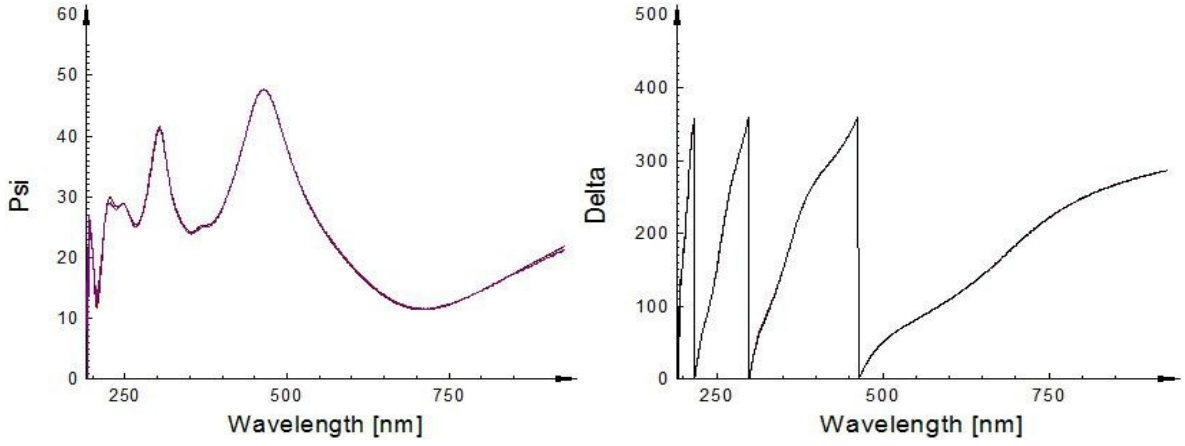


Figure S4. Experimental and fitted ellipsometry curves of the 10 nm Ti/Gr device.

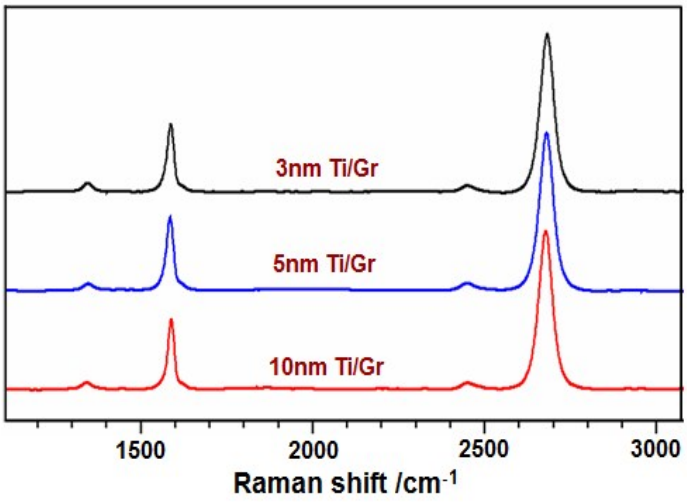
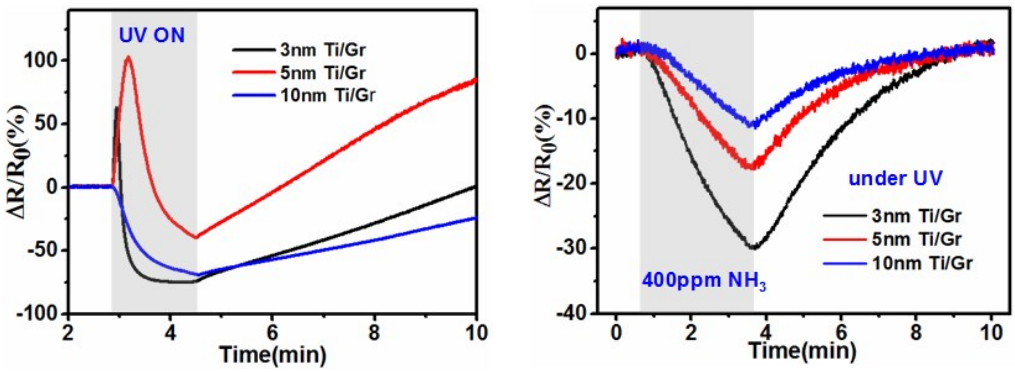


Figure S5. Micro-Raman spectra of the 3, 5, and 10nm Ti/Gr devices.



(a) (b)

Figure S6. (a) The resistance change of the Ti/Gr devices when initially exposed to UV (254nm) light illumination, the gray area in the figure represents the time of UV light illumination, (b) The response of the Ti/Gr devices when exposed to 400ppm NH_3 for 3 minutes under UV light illumination, the gray area in the figure represents the 3 min exposure to 400 ppm NH_3 gas.

Table S1. Fitted parameters derived from ellipsometry data of the 3, 5 and 10 nm Ti/Gr devices.

Devices	**3nm Ti/Gr**	**5nm Ti/Gr**	**10nm Ti/Gr**
Thickness of Titanium oxides (nm)	**3.13**	**5.1**	**9.5**
Thickness of graphene (nm)	**0.34**	**0.34**	**0.36**
Thickness of SiO_2 insulating layers (nm)	**298.6**	**295.5**	**291.6**
Mean square error of fitting	**1.28**	**1.3**	**1.01**

Table S2. The response/recovery times of the devices in the dark and under visible light illumination.

Devices		**3nm Ti/Gr**	**5nm Ti /Gr**	**10nm Ti /Gr**
Response time (min)	**in the dark**	2.6	2.7	2.7
	under light	2.9	2.5	2.5
Recovery time (min)	**in the dark**	7.2	5.2	4.7
	under light	4.9	2.7	3.4